

NEW EXPANDED TOBACCO

Objectives

1. Develop an expanded tobacco material having more "tobacco-like" subjective.
2. Reduce degradation to allow for improved product quality and better yield.
3. Reduce CO₂ emissions as compared to DIET.

Strategies

DIET Improvement

1. Assure plug flow, short residence time at tower infeed.
2. Provide uniform gas-tobacco distribution in the tower.
3. Eliminate separator recycle.
4. Provide plug flow discharge from separator with proper residence time for thermal treatment.
5. Determine if fundamental degradation principles identified in the initial clump-free DIET development apply in the Australian DIET plant.
6. Reduce degradation from impregnator discharge to vibrating grid.
7. Evaluate potential of gas impregnation and, if applicable, determine modifications to current DIET process design to allow for future use.
8. Evaluate existing DIET pilot plant instrumentation and modify as required to provide for adequate and efficient data evaluation.
9. Support design of gaseous batch impregnation process.

Continuous Impregnation Process

1. Develop a tobacco precooling process for batch and continuous gaseous impregnation.

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2. Determine conditions of tobacco impregnation with gaseous CO₂ over a pressure range of 200 to 900 psi.
3. Develop, design and fabricate process equipment for a continuous impregnation pilot process.
4. Install and test a pilot system for a continuous gaseous impregnation process.
5. Develop, design, and fabricate a continuous impregnation process utilizing a linear-pocket feeder system.
6. Investigate and evaluate the possibility of inert gas impregnation.
7. Determine the effect of filler casing on gaseous impregnation.
8. Evaluate the degree of subjective improvement associated with gaseous impregnation.
9. Determine the physical and/or chemical forms the impregnant takes within the tobacco.
10. Quantify the sorption properties of the substrate at equilibrium.
11. Quantify the sorption properties of the tobacco substrate under dynamic conditions.

Alternate Puff/Dry/Set Techniques

1. Determine conditions for optimum puffing.
2. Determine mechanisms which are responsible for collapse in or exiting the expansion tower.
3. Determine the process/product parameters which control product setting.
4. Define the role and mechanism of stiffening in determining product quality.
5. Define expanded product quality measures which translate directly into cigarette quality measures.

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- 6. Determine if cooling tobacco after expansion/setting improves subjectives with no negative impact on product physical characteristics.
- 7. Implement the defined processing steps/parameters in pilot expansion process.
- 8. Optimize and evaluate the processing schemes.

High Capacity Processes for Partial Expansion of Tobacco

- 1. Review and summarize previous work.
- 2. Identify potential processing schemes and test concepts with existing equipment, lab evaluations, and/or vendor tests.
- 3. Construct a pilot development facility.
- 4. Determine the relationship between processing conditions and subjective/physical properties for each tobacco type (bright, burley, oriental).
- 5. Compare the effect of blend expansion in various combinations with the expansion of individual blend components on subjective/physical properties.
- 6. Determine the contribution of DIET and ES components to subjective/physical properties both as standard expanded products and as included in partial expansion.
- 7. Analyze blend similarities and production requirements for all brands.
- 8. Propose one or more processing schemes for detailed physical, chemical, subjective, and economic evaluation.

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